

What is claimed is:

1. An inflation assembly effective for supplying a quantity of inflation gas to at least one associated inflatable restraint device, the inflation assembly comprising:

a first chamber containing supply of a first reactant material effective, upon reaction, to produce first reaction products at least including a quantity of gas and a quantity of heat;

a first initiator in reaction initiating discharge communication with at least a portion of the supply of the first reactant material contained within the first chamber, the first initiator effective upon actuation to initiate reaction of at least a portion of the supply of the first reactant material contained within the first chamber,

a diffuser chamber having a first end and a second end, the diffuser chamber in gas flow communication through the first end with the first chamber upon actuation of the first initiator, the diffuser chamber effective to discharge gas into the at least one associated inflatable restraint device,

at least one gas treatment element at least in part disposed within the diffuser chamber, the at least one gas treatment element effective for treating gas being discharged into the at least one associated inflatable restraint device,

a second chamber having contents including a supply of at least one gas source material, the second chamber closed in a static state with the supply of the at

least one gas source material compressed therewithin, the second chamber openable upon actuation thereof whereby at least a portion of the second chamber contents are in gas flow communication through the second end with the diffuser chamber and the at least one gas treatment element disposed therewithin, and

a chamber opener effective upon actuation of the inflation assembly to open the second chamber and to release at least a portion of the second chamber contents into gas flow communication with the diffuser chamber and the at least one gas treatment element disposed therewithin.

2. The inflation assembly of claim 1 wherein the first reactant material is a pyrotechnic material.

3. The inflation assembly of claim 1 wherein the at least one gas source material comprises at least one inert gas.

4. The inflation assembly of claim 1 wherein the at least one gas source material comprises nitrous oxide.

5. The inflation assembly of claim 1 wherein the at least one gas source material comprises nitrous oxide and at least one inert gas.

6. The inflation assembly of claim 1 wherein the at least one gas treatment element comprises a filter.

7. The inflation assembly of claim 1 wherein the chamber opener comprises a projectile.

8. The inflation assembly of claim 7 wherein the second chamber includes an opening closed in a static state by a rupturable seal and wherein the first reaction products at least in part propel the projectile into the rupturable seal to effect the rupture thereof.

9. A combination comprising the inflation assembly of claim 1 and at least one associated inflatable restraint device, wherein the at least one associated inflatable restraint device comprises an inflatable curtain restraint device.

10. A method for inflating an inflatable restraint device using the inflation assembly of claim 1 wherein the at least one gas treatment element is heated by contact with the first reaction products and wherein the portion of the second chamber contents released into gas flow communication with the diffuser chamber and the at least one gas treatment element contact the heated treatment element.

11. The method of claim 10 wherein the at least one gas source material has a first molar content and comprises nitrous oxide and in which method at least a portion of the nitrous oxide contacting the heated treatment element dissociates to form dissociation products having a second molar content, where the second molar content is greater than the first molar content.

12. The inflation assembly of claim 1 wherein the first chamber, the diffuser chamber and the second chamber are longitudinally aligned.

13. The inflation assembly of claim 1 wherein the first chamber and the second chamber are adjacently disposed side-by-side.

14. An inflation assembly effective for supplying a quantity of inflation gas to at least one associated inflatable restraint device, the inflation assembly comprising:

a first chamber containing supply of at least one pyrotechnic gas generant material effective, upon reaction, to produce first reaction products at least including a quantity of gas and a quantity of heat;

a first initiator in reaction initiating discharge communication with at least a portion of the supply of the at least one pyrotechnic gas generant material contained within the first chamber, the first initiator effective upon actuation to initiate

reaction of at least a portion of the supply of the at least one pyrotechnic gas generant material contained within the first chamber,

a diffuser chamber having a first end and a second end, the diffuser chamber in gas flow communication through the first end with the first chamber upon actuation of the first initiator, the diffuser chamber effective to discharge gas into the at least one associated inflatable restraint device,

at least one gas treatment element at least in part disposed within the diffuser chamber, the at least one gas treatment element effective for treating gas being discharged into the at least one associated inflatable restraint device,

a second chamber, in a static state, having contents including a supply of at least one compressed gas, the second chamber having at least one opening closed in a static state by means of at least one seal, and

a chamber opener effective upon actuation of the inflation assembly to open the second chamber and to release at least a portion of the gas source material into gas flow communication through the second end with the diffuser chamber and the at least one gas treatment element disposed therewithin.

15. The inflation assembly of claim 14 wherein the at least one gas source material comprises at least one inert gas.

16. The inflation assembly of claim 14 wherein the at least one gas source material comprises nitrous oxide.

17. The inflation assembly of claim 14 wherein the at least one gas source material comprises nitrous oxide and at least one inert gas.

18. A combination comprising the inflation assembly of claim 14 and at least one associated inflatable restraint device, wherein the at least one associated inflatable restraint device comprises an inflatable curtain restraint device.

19. A method for inflating an inflatable restraint device using the inflation assembly of claim 14 wherein the at least one gas treatment element is heated by contact with the first reaction products and wherein the portion of the second chamber contents released into gas flow communication with the diffuser chamber and the at least one gas treatment element contact the heated treatment element.

20. The method of claim 19 wherein the at least one gas source material has a first molar content and comprises nitrous oxide and in which method at least a portion of the nitrous oxide contacting the heated treatment element dissociates to form dissociation products having a second molar content, where the second molar content is greater than the first molar content.

21. The inflation assembly of claim 14 wherein the first chamber, the diffuser chamber and the second chamber are longitudinally aligned.

22. The inflation assembly of claim 14 wherein the first chamber and the second chamber are adjacently disposed side-by-side.

23. An assembly for supplying inflation gas to an inflatable restraint device, the assembly comprising:

a diffuser chamber having at least one discharge opening effective to discharge gas into the inflatable restraint device, the diffuser chamber having first and second ends with a pyrotechnic inflator device disposed at the first end and a stored gas chamber disposed at the second end,

the pyrotechnic inflator device including a first chamber containing supply of at least one pyrotechnic gas generant material effective, upon reaction, to produce first reaction products at least including a quantity of gas and a quantity of heat, the pyrotechnic inflator device also including an initiator in reaction initiating discharge communication with at least a portion of the supply of the at least one pyrotechnic gas generant material contained within the first chamber, the first initiator effective upon actuation to initiate reaction of at least a portion of the supply of the at least one pyrotechnic gas generant material contained within the first chamber,

the stored gas chamber, in a static state, having contents including a supply of at least one stored compressed gas, and

at least one gas treatment element at least in part disposed within the diffuser chamber, the at least one gas treatment element effective for treating gas being discharged into the inflatable restraint device,

a chamber opener at least in part disposed between the at least one gas treatment element and the stored gas chamber, the chamber opener effective upon actuation of the inflation assembly to open the second chamber and to release at least a portion of the stored gas chamber contents into gas flow communication with the diffuser chamber and the at least one gas treatment element disposed therewithin.

24. The inflation assembly of claim 23 wherein the at least one gas source material comprises at least one inert gas.

25. The inflation assembly of claim 23 wherein the at least one gas source material comprises nitrous oxide.

26. The inflation assembly of claim 23 wherein the at least one gas source material comprises nitrous oxide and at least one inert gas.



27. A combination comprising the inflation assembly of claim 23 and at least one associated inflatable restraint device, wherein the at least one associated inflatable restraint device comprises an inflatable curtain restraint device.

28. A method for inflating an inflatable restraint device using the inflation assembly of claim 23 wherein the at least one gas treatment element is heated by contact with the first reaction products and wherein the portion of the second chamber contents released into gas flow communication with the diffuser chamber and the at least one gas treatment element contact the heated treatment element.

29. The method of claim 28 wherein the at least one gas source material has a first molar content and comprises nitrous oxide and in which method at least a portion of the nitrous oxide contacting the heated treatment element dissociates to form dissociation products having a second molar content, where the second molar content is greater than the first molar content.

30. The inflation assembly of claim 23 wherein the first chamber, the diffuser chamber and the second chamber are longitudinally aligned.

31. The inflation assembly of claim 23 wherein the first chamber and the second chamber are adjacently disposed side-by-side.